U.S. AIR FORCE



Aviation Maintenance Safety Conference 27 - 30 April 2004

NAVAL SAFETY CENTER EST. 1951

Naval Safety Center Media Products and Mech Magazine

43 Years of Service to the Fleet

Dan Steber, Editor

John Williams, Designer

Mech Facts

- Est. 1961
- Quarterly (15 years as a bi-monthly)
- 17,343 copies
- 1,770 different commands or organizations:
  - Navy, Marines, Air Force, Army and Coast Guard
  - Contractors (Lockheed, Boeing, and others)
  - Government agencies (FAA, NASA, Customs, NTSB and others)
  - Foreign military (Canada, England, Australia, New

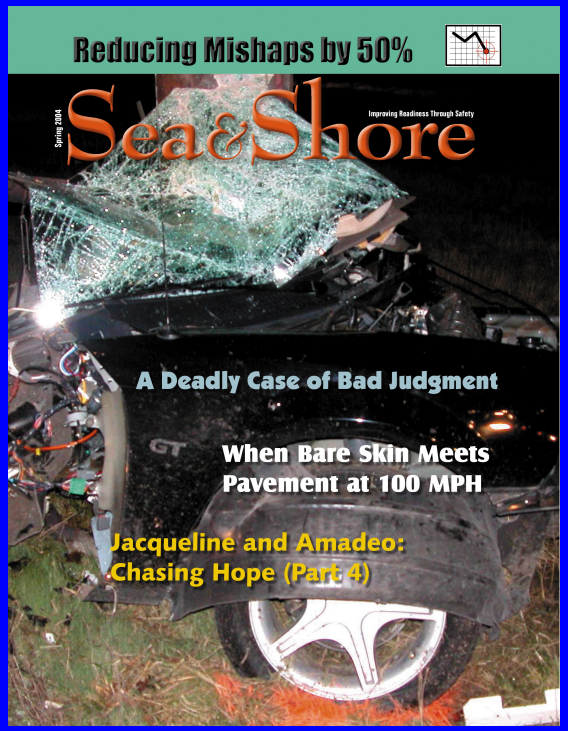
Features

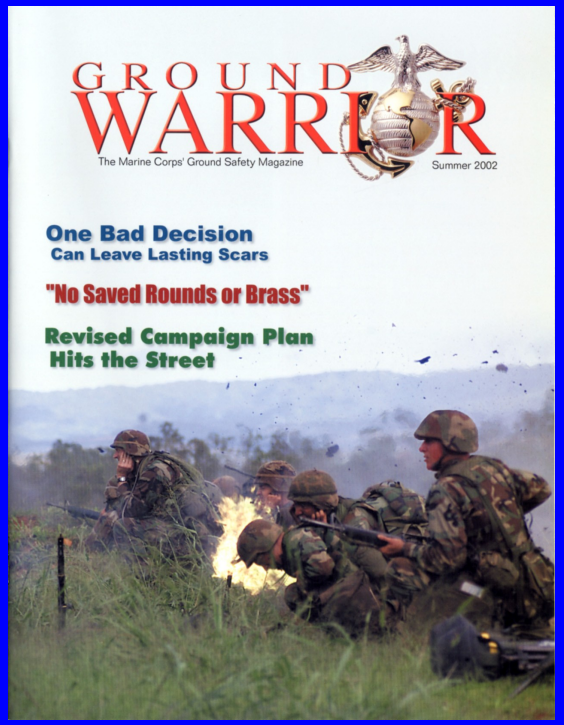
- Bravo Zulus
- Crossfeed
- Air Wing Toolbox
- Mishap Stats
- Survey Spotlight
- Work Zone
- Good, Bad & Ugly
- Editorial
- Centerspread Posters
- Back Cover Posters

Mech on the Web

- www. mil/ m
- Cur copie y
- Mai Spotli e
- Con
- Mech vault

Other Media Products





Aviation Flight Safety

(1955)
1,880 addresses
15,609 copies

U.S. military, Contractors, Foreign Military, and Government agencies.

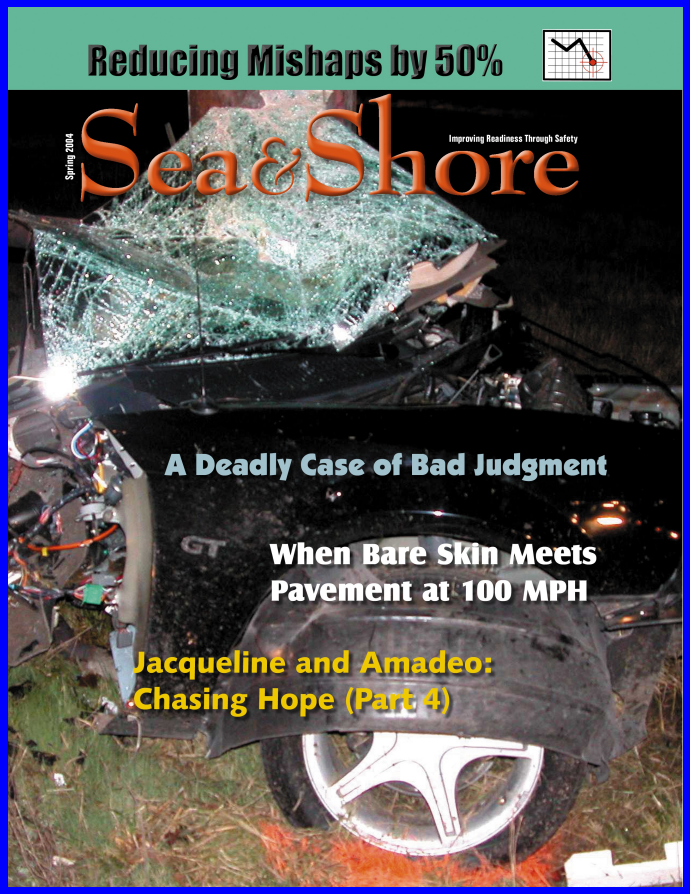
Features

- “There I was…” flight-related stories
- ORM/CRM
- Brownshoes in Comix
- Work Zone
- Good, Bad & Ugly
- Bravo Zulus
- Mishap-Free Milestones
- Ready Room Gouge

Type Stories

Sea and Shore Safety

(1972) Lifeline
(1985) Safetyline
(1999) Ashore
(2004) Sea&Shore

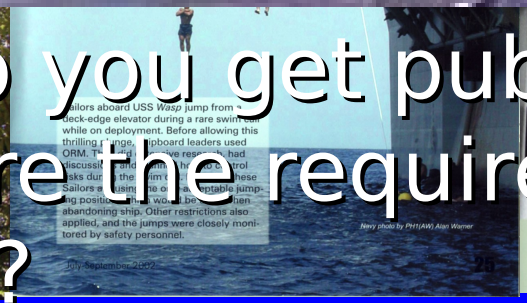


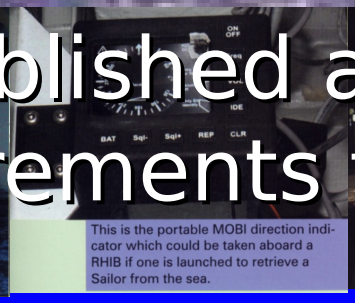
2,870 addresses
29,040 copies

All DoD branches, other federal agencies, private vendors, and foreign governments

Features

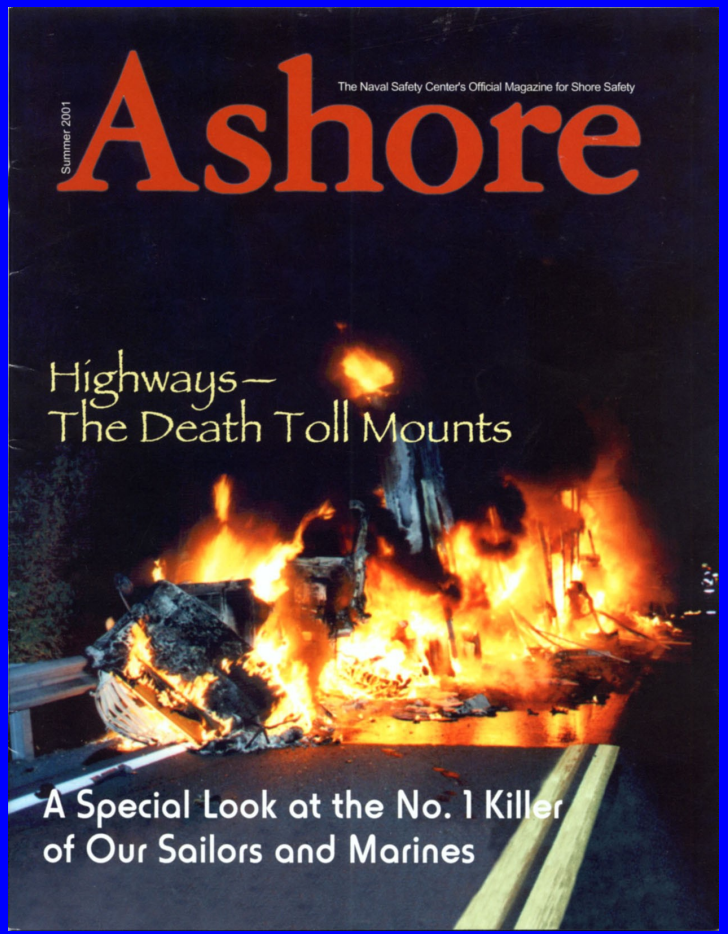
- Traffic, off-duty, ship on-duty incidents, fire, OSH, recreation, athletic, high-risk training, and explosives & weapons
- Hats Off
- Our Dying Numbers
- Lucky Bag
- Binnacle List
- Back-cover safety posters
- Annual traffic-safety issue





How do you get published and what are the requirements for a story?

Is It Live or Memorex?



Ready Room Gouge

The purpose of the propeller is to keep the pilot cool.

If you think not, stop the propeller and watch him sweat.

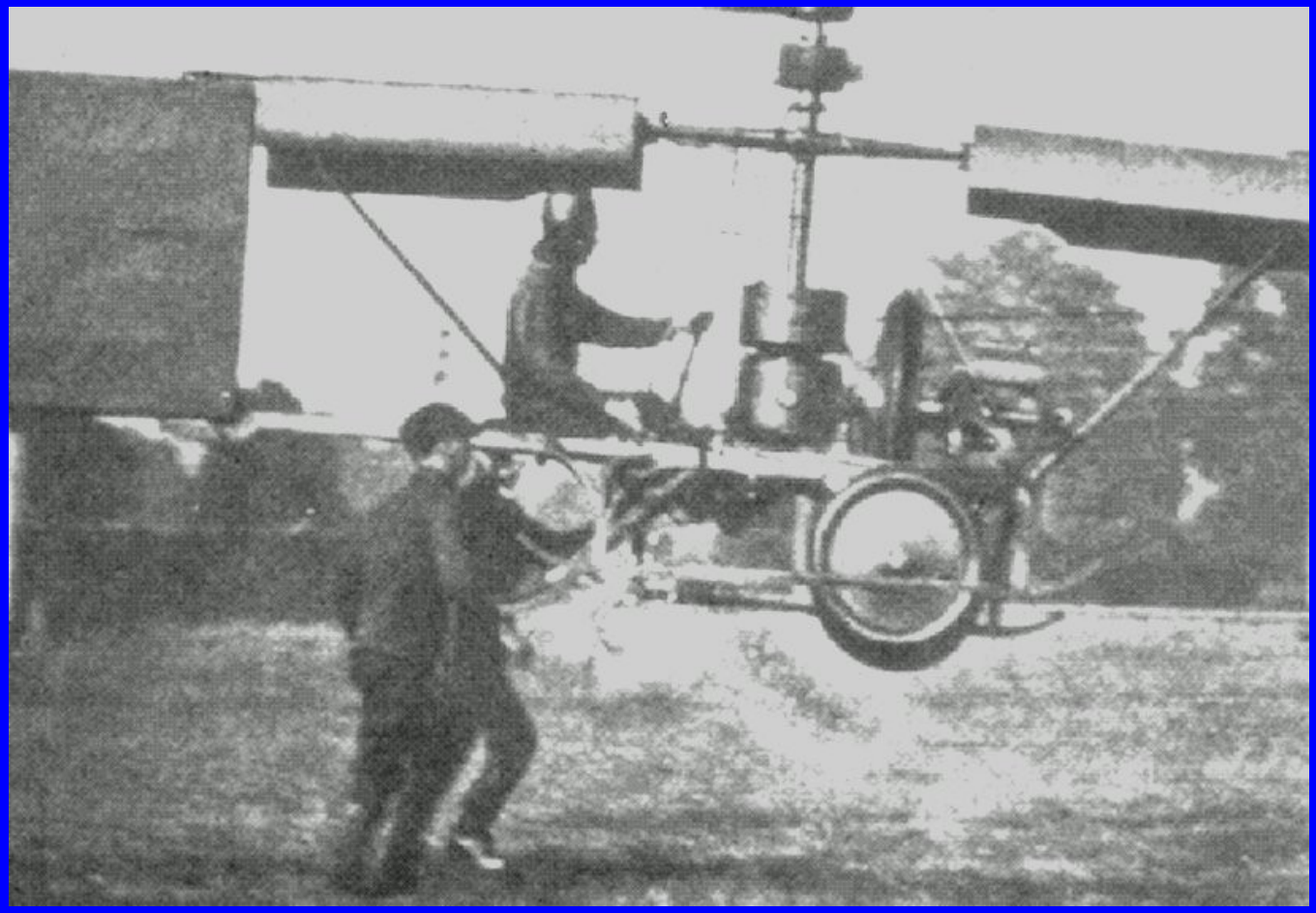
NAVAL SAFETY CENTER EST. 1951

www.safetycenter.navy.mil

EP-3 Photo by Matthew J. Thomas
Background by Allan Amen

STRAIGHT DOWN AT 610 KNOTS

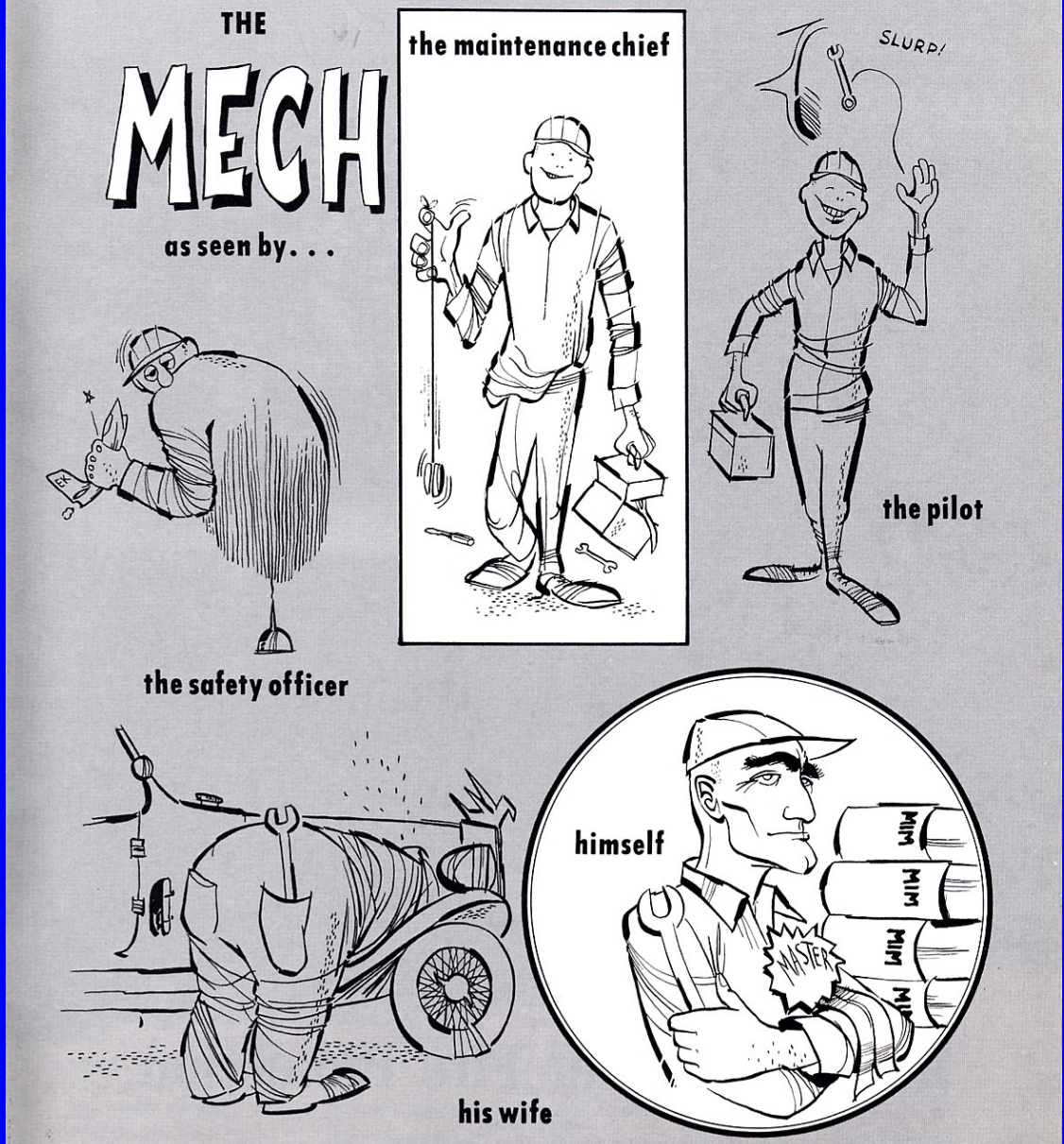
We've Come a Long Way



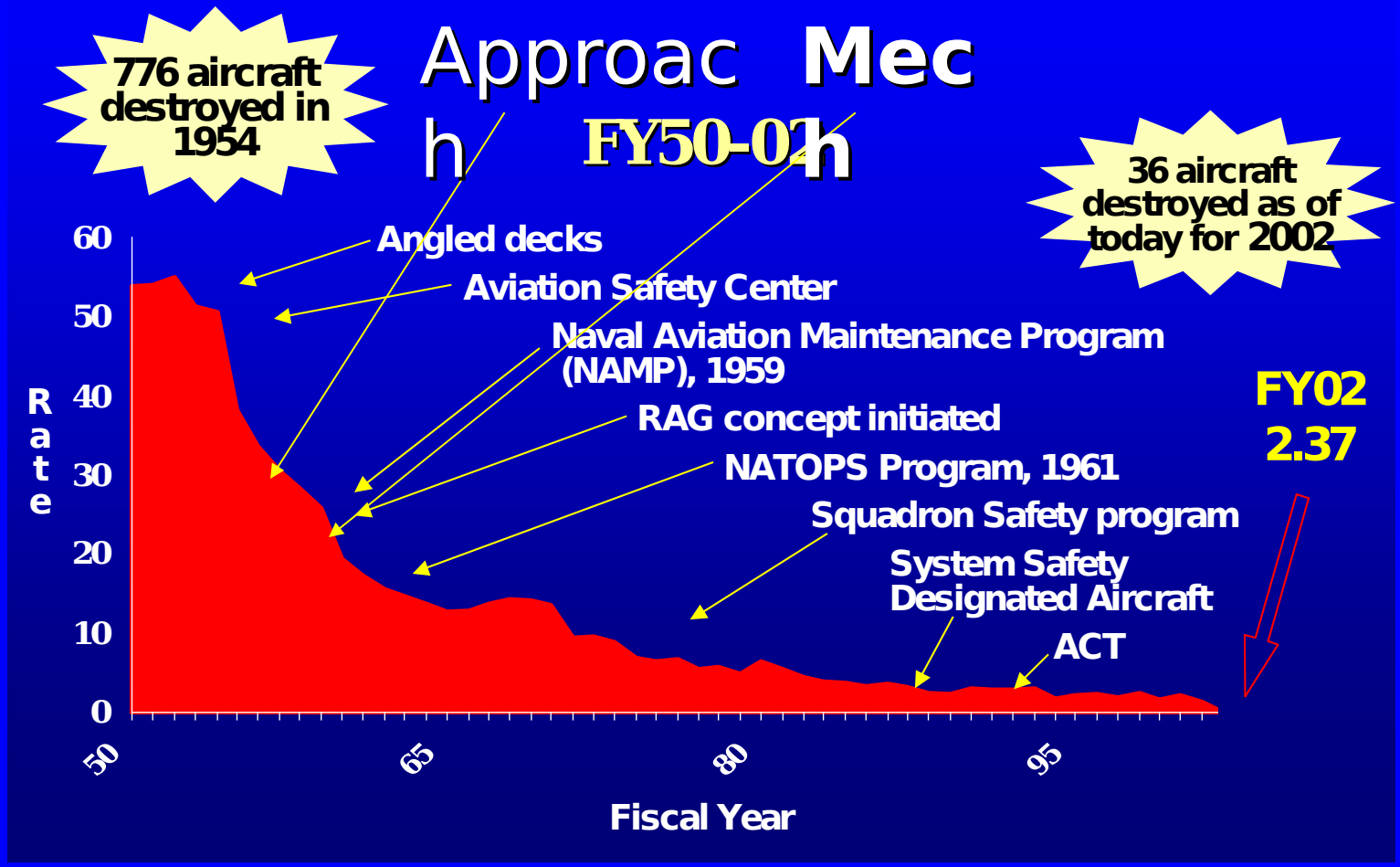
In Maintenance, Too

Winter

1969


THE
MECH
as seen by. . .
the maintenance chief
SLURP!
the pilot
the safety officer
himself
MIM
MIM
MIM
MIM
MASTER
his wife

Naval Aviation Mishap Rate



A Few Mishap Stats

Maintainers…FY-94 to Present

On the Job = 11 On the Road = 96 On the Field = 38

Marine

Civilian Maintainer

Civilian Handler

Navy

High Traffic Deaths – AM3-8, AD3-6, AO3-6, AT3-5 and ADAN-5

High Shore Deaths – AT2-6, ATAN-4, AT3-3, AE2-2, AEAN-2,

Avg. Rate: 45.93	
AW3	211.76
AZAN	194.17
PRAN	133.33
ADAN	130.86
ABE2	127.12
ABF3	123.46
ABAN	111.02
AM3	108.53
AO3	85.32
AZ3	95.24

Avg. Rate: 65.59	
AW3	235.29
ABF3	176.37
PR3	154.24
AS3	150.83
AZAN	145.63
AS2	140.66
AD3	137.89
AE3	136.88
AE2	128.43
PRAN	145.62

Requests for Articles

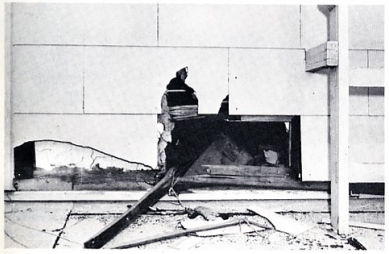
shops or around aircraft.

- The importance of using the proper tools and equipment for a particular job.

Don't Point It At Me

VERY few people think of helicopter equipment as being dangerous. Really dangerous – know what I mean? Well, the crew that was pulling a routine calendar check on a UH-2C found out the hard way. Seems that maintenance personnel were running an electrical continuity check for the flotation gear when a gas generator bottle was inadvertently activated. *The bottle ripped from the aircraft, glanced off one man (inflicting serious injuries), went through the hangar wall and came to rest on the second deck of a storage room.* No one had checked to ensure that the cannon plugs on the gas generator were disconnected before running the continuity check. Maintenance personnel error, inexperience and lack of supervision were the cause factors. The crew failed to conduct the maintenance functions in the sequence spelled out by the MRCs. Among other things, doing a job by the MRCs will eliminate misguided missiles.

Arrow indicates flight path of gas generator.



Damage area wrought by flying gas generator.

Summer 1970

My Second Day in the Navy

By Lt. John F. Woods, USN
Patrol Squadron 10
NAS Brunswick, Maine

NOW that I've gained more experience as a naval officer, I can talk about the mistakes I made as an ensign. This particular incident happened on my second day in the Navy, when I was probably the most eager individual alive. I was ready to take on *any* task.

My department head told me to establish a flammable storage area. No problem — I just went out and picked up a large insulated box I found at a defense disposal site and brought it back to my facility. Now, what to do with it? Well, being I was a college graduate, I was sure I could figure my way through that job all by myself. However, for physical assistance, I cornered a first-class petty officer and got him to help me out.

The first task we had was to clear an area for the box. I directed the petty officer to get a forklift so we could move some large racks of high-pressure nitrogen bottles out of the way. The racks were in pretty bad shape, but they looked like they would hold together. (And besides, I told the forklift operator to be *very* careful.) While I steadied the bottles, the forklift picked up the rack ever so slowly, but the rack didn't hold together and nine bottles of nitrogen gas came tumbling down. As they fell, one bottle had the valve sheered off its top.

When I saw that gas billowing out and the bottle starting to move away, my first stupid reaction was to put my foot on it. My second was to call for the help of my assistant, who was by then well out of shouting range. Fortunately for me, the bottle was practically empty and shortly thereafter, ran out of gas. There was little damage done (with the exception of that done to my ego) and no one was injured. It was obvious, though, that things could have been worse.

There are two lessons to be learned from this event:

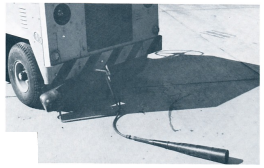
- First and most important is for young or inexperienced officers. T are people specially qualified for supervising any task in the Navy — they are called "chief petty officer Don't discount their abilities. Use them; their experience is invaluabl
- The other lesson is for the pet officer or non-rated sailor. Don't j *assume* your immediate supervisor knows best; if you have any doubts him/her know about it! This is not say you should question your supervisor's authority; just offer yo advice and watch out for each othe

Most jobs in the Navy involve TEAMWORK. Use this teamwork approach to accomplish all tasks sa and properly.

We maintenance types sometimes tak delight in "setting up" the new fuzzy-f officer. Always make sure (for everybod sake) no safety or maintenance procedur violated. As the lieutenant said, "We a on the same team." — Ed.

April/May 1985

UNGUIDED MISSILE

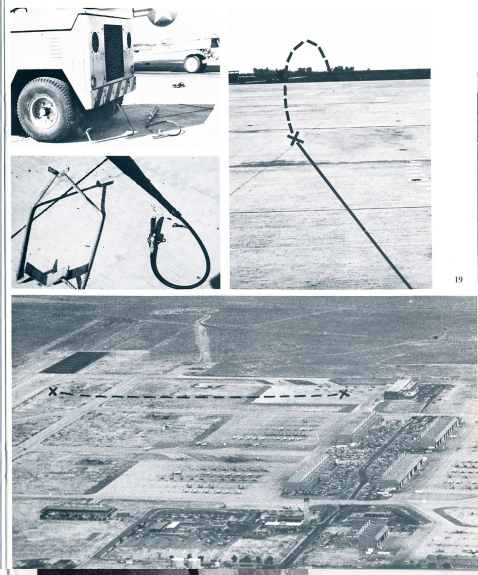


THE PLANE captain had disconnected the NC-8A MEPP (mobile electric power plant) from one aircraft, climbed into the driver's seat, and was proceeding to another aircraft when the vehicle struck a fire bottle sitting in a brace on the aircraft line. Contact was made on the starboard front part of the NC-8, wedging the fire bottle's neck and handle between the bumper and the brace.

The bottle and brace were pushed along the deck for about 15-20 feet, while simultaneously the rotation of the vehicle's right front tire was unscrewing the bottle from its handle and valve assembly. The bottle separated from the handle and valve assembly just as the NC-8 was brought to a stop. The escaping CO_2 propelled the bottle along the deck for about 50-60 feet, at which point the bottle became an airborne missile. It attained a height of approximately 200 feet before finally coming down between the taxiway and runway – a quarter of a mile away. The errant missile passed within 15-16 feet of the aircraft from which the plane captain had just departed.

The incident happened during launching of the last aircraft scheduled to meet an overhead time at the ship. The first NC-8 went down, and in his haste to return with another one, the plane captain failed to properly survey the area around the aircraft. That neither the aircraft nor the men working on it were struck by the fire bottle is extremely fortunate. The outcome could well have been death or serious injury and major damage to the aircraft.

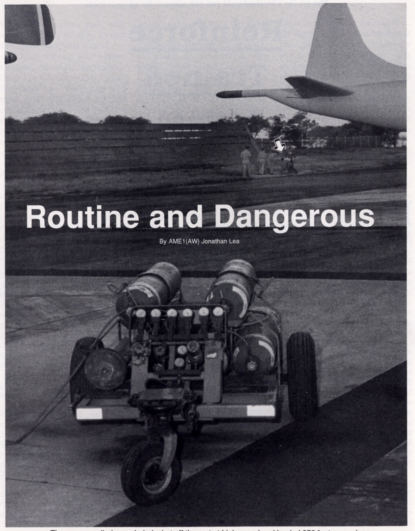
No commitment is so definite that we can't afford to use good judgment to ensure taking the "dead" out of the term "deadline."



19

Routine and Dangerous

By AME1(AW) Jonathan Lea



The oxygen cylinder exploded, shot off the cart at high speed and landed 250 feet away, (see arrow) behind another P-3C.

Mech

The cylinder exploded . . .

It was a typical "mid-check" of preparing aircraft for the upcoming day's events:

A maintenance technician performed pre-op on an oxygen cart and was preparing to service a P-3C's main oxygen system during daily inspection of aircraft. After opening the shut-off valves on all oxygen cylinders, he opened the manifold lever on the No. 1 cylinder to pressurize the regulator. As the technician leaned over so he could read the No. 1 gauge, he heard a hissing sound. Within seconds, the cylinder exploded, accompanied by an orange glow, sparks and flames.

As the technician ran from the area, he saw the flaming No. 1 cylinder shoot off the cart at high speed. It landed 250 feet away in a gravel area behind another P-3C on the line. The technician and a nearby lineman, who had grabbed a flight-line fire bottle, immediately approached the cart. They closed the shut-off valves on the remaining hot cylinders and pushed the cart away from the aircraft.

This incident proves how dangerous a routine operation like "mid-check" can be. We were lucky the mishap didn't injure anyone or damage any aircraft. Investigators haven't found what caused the explosion and fire, but the fact that it happened reinforces the importance of taking every precaution when working with pressurized oxygen. By itself, oxygen is non-combustible. When combined with combustible materials such as oil and grease, however, chemical reactions can produce spontaneous combustion. No ignition source is needed.

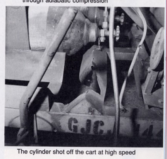
Fortunately, the maintenance technician in this mishap was a pro. He took two basic safety precautions that may have saved an aircraft: He pushed the cart outside and parallel to the safety diamond, then he set the brakes. These two steps helped ensure the cart didn't move during the explosion and that the oxygen cylinder left the cart along a path away from the aircraft.

The bottom line is that anything can change a minor mishap into a major disaster, but you can break the chain of events by following basic safety practices. ★

AME1(AW) Lea is assigned to Patrol Squadron One.

Analyst note: The oxygen cart fire was caused by teflon tape exposed to the oxygen system and ignited through adiabatic compression. SEB 616 requires disassembly and inspection of all oxygen trailers for excess teflon tape, and instructions for the application of teflon tape upon reassembly. SEB 616 also included revised operating instructions to minimize the risk of adiabatic compression. Provisioning data has been changed to incorporate metal-lined flex hoses to minimize the amount of teflon exposed to the oxygen system.

Teflon tape exposed to oxygen ignited through adiabatic compression



The cylinder shot off the cart at high speed

September/October 1990

Mech: Then and Now

Rely on the HMI

Errors in maintenance and servicing can be reduced, if not

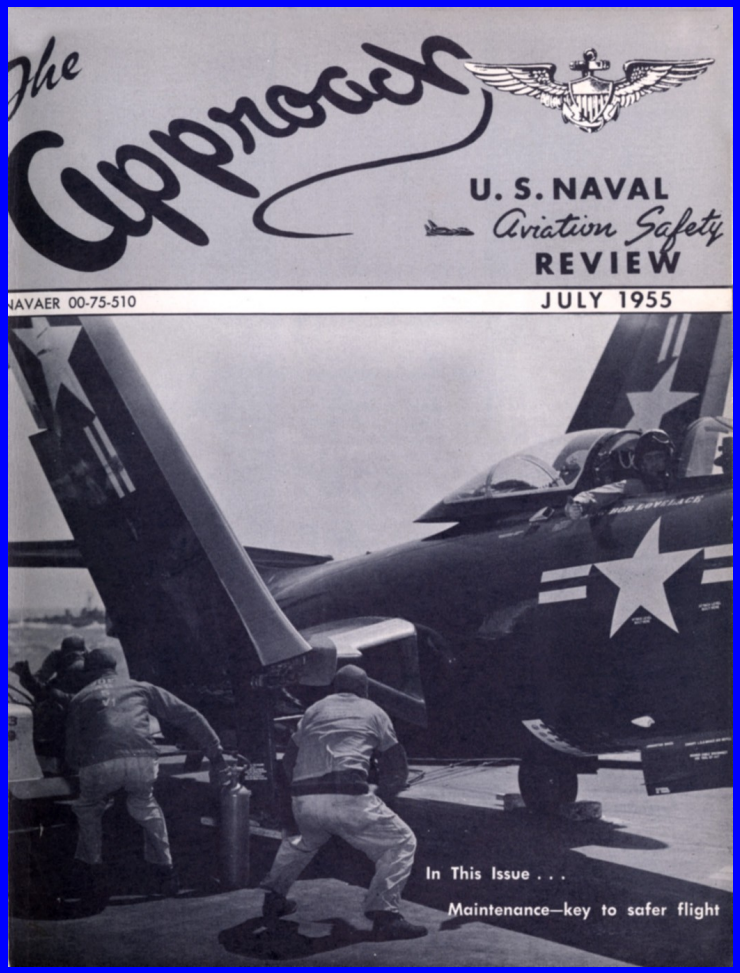
nted, when proper knowledge, practices and standards are

ion from established procedures, failure to use “the written

a lack of appreciation for standards in aircraft maintenance

conditions that prevail and need to be corrected.

Mech in Approach



Foul Play!

Correct diagnosis and treatment of fouled sparkplugs will improve performance, reduce maintenance.

ANYMOUSE Report No. 253 indicated that "many pilots and mechanics" do not know the correct methods of clearing sparkplugs fouled by carbon and lead. Anymouse suggested that a precise description be given of the correct procedures to obtain a satisfactory mag check. Here's a general review of such SOP.

There are many factors which can influence the operation of sparkplugs. Some of these will seem to indicate that the sparkplug is at fault, while actually, the trouble is caused by some other part of the ignition system, engine or by improper maintenance or operating practices.

With such complexities at hand it is impractical to include all the important aspects concerning sparkplug performance in this discussion. Therefore, only the factors concerning carbon fouling and lead fouling will be discussed, which are perhaps, the greatest problems encountered in the field.

CARBON FOULING

The majority of cases of carbon fouling are caused from improperly set idle mixture. Whenever excessive RPM drop is encountered during magneto check the engine should be throttled back to 800 rpm and the mixture control leaned beyond the best power until a drop in RPM of approximately 50 rpm is obtained. The mixture will now be approximately "best economy" and contain sufficient excess oxygen to burn off moderate accumulations of oil and carbon.

One minute of idling at this condition *for each 10 minutes* of normal warmup, idling or taxiing should help to clean plugs for takeoff.

Low Cylinder Head Temperature

Sparkplugs can be fouled during flight by diving or gliding for long periods of time at excessively low manifold pressures. Oil pumped past the piston rings during this time may not burn off the plugs while the engine is cool, and will foul the sparkplugs with carbon and oil. Sparkplugs that are fouled in this manner may usually be cleared by applying throttle *slowly* after the glide.

Prolonged glides or dives conducted at about 15" MP or above will prevent this type of fouling by burning away the oil as it passes the rings. Carbon fouling in flight can also be caused by a very low power setting with an excessively rich mixture.

The cure is to increase the power setting or adjust mixture manually to obtain peak cylinder head temperature. Avoid excessive leaning where head temperatures are below 175° C or lead-fouling may be encountered.

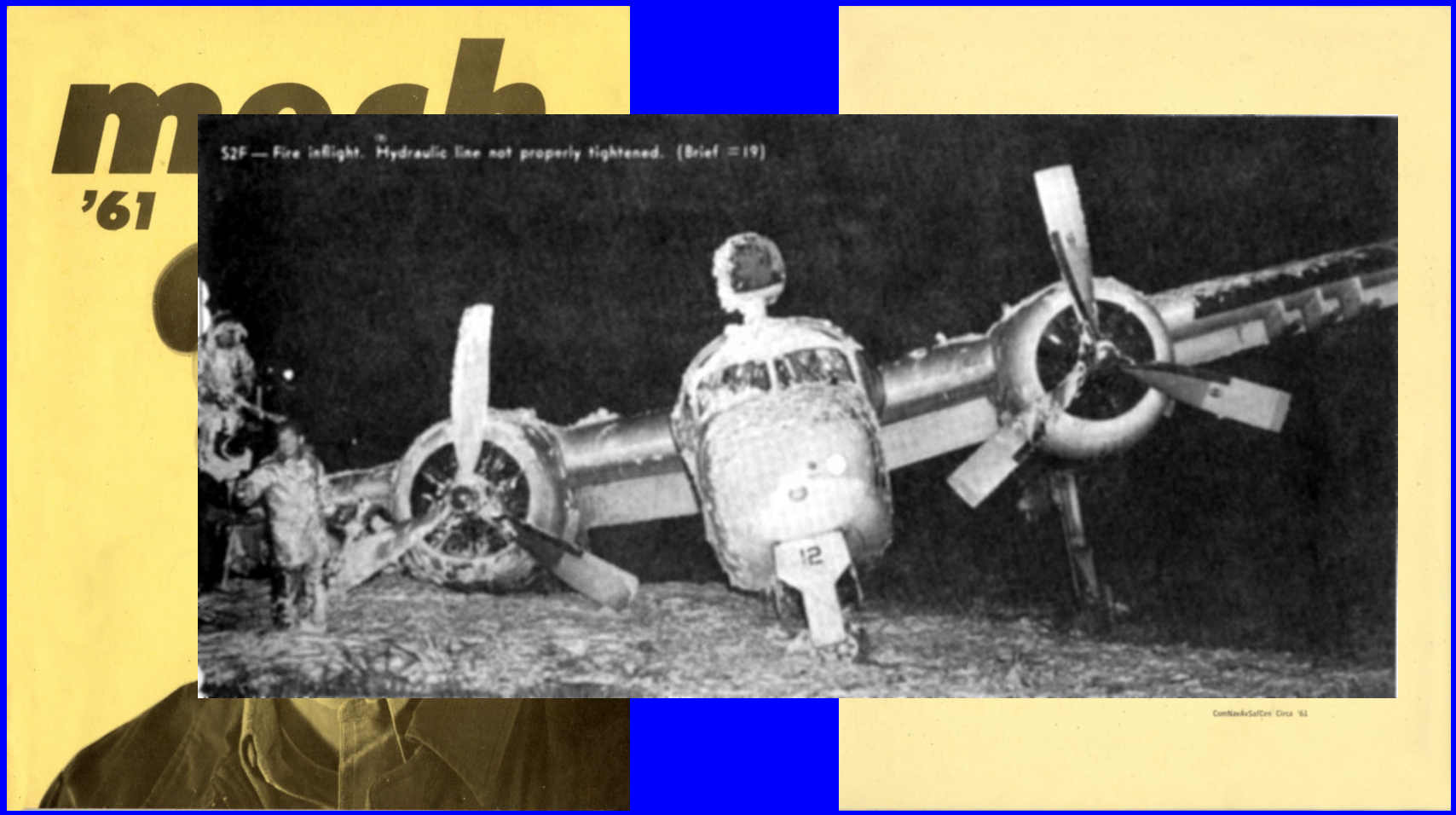
Oil and Carbon

Sparkplugs may be fouled also during ground running by oil or by carbon resulting from incomplete combustion of gasoline. This type

1950s

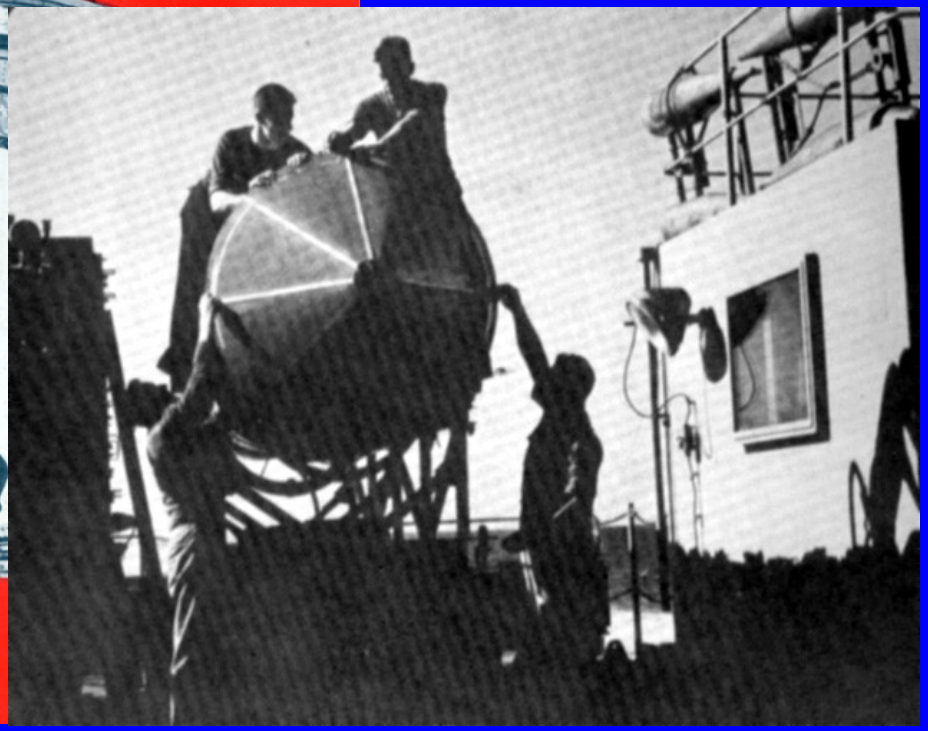
Flight Deck Dangers

1960s

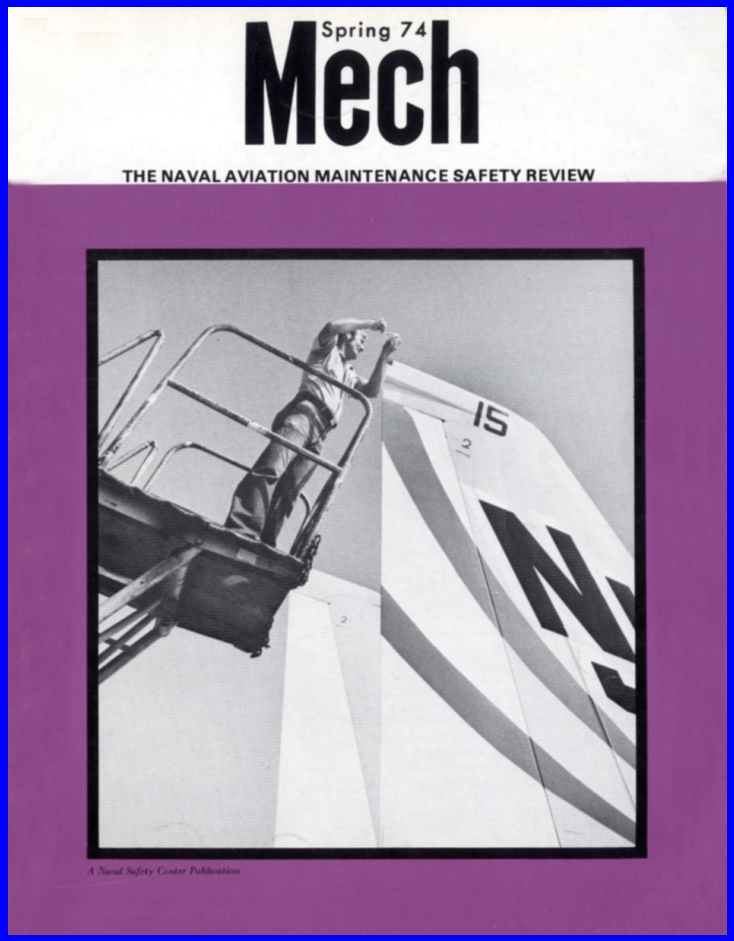

'61
52F — Fire inflight. Hydraulic line not properly tightened. (Brief #19)
12
ComNavAvSafCen Circa '61

1966

MECH 66

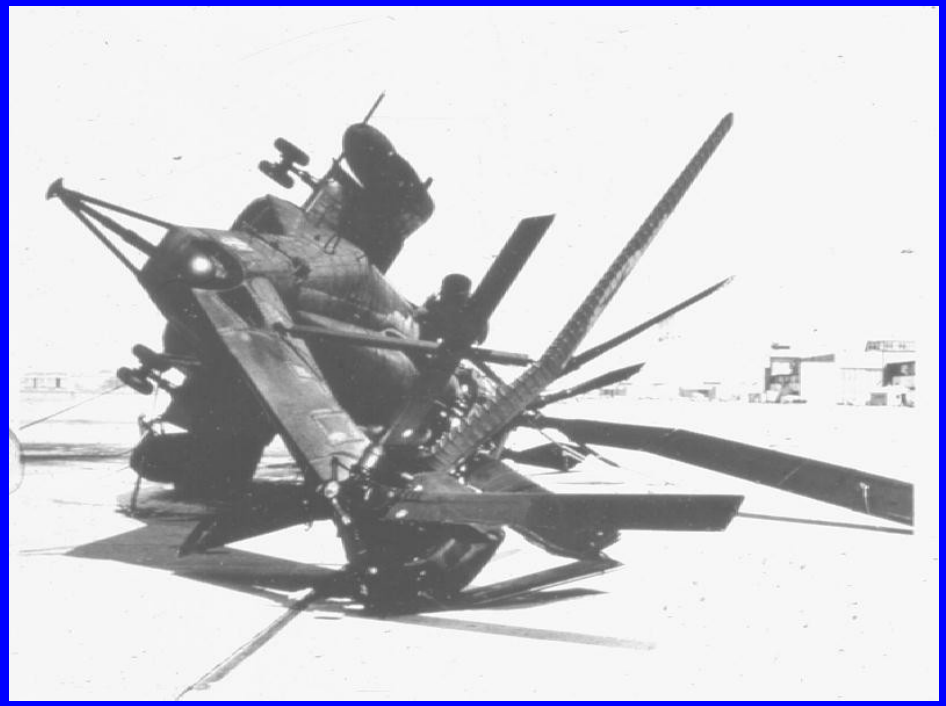


1970s


Spring 74
Mech
THE NAVAL AVIATION MAINTENANCE SAFETY REVIEW
A Naval Safety Center Publication

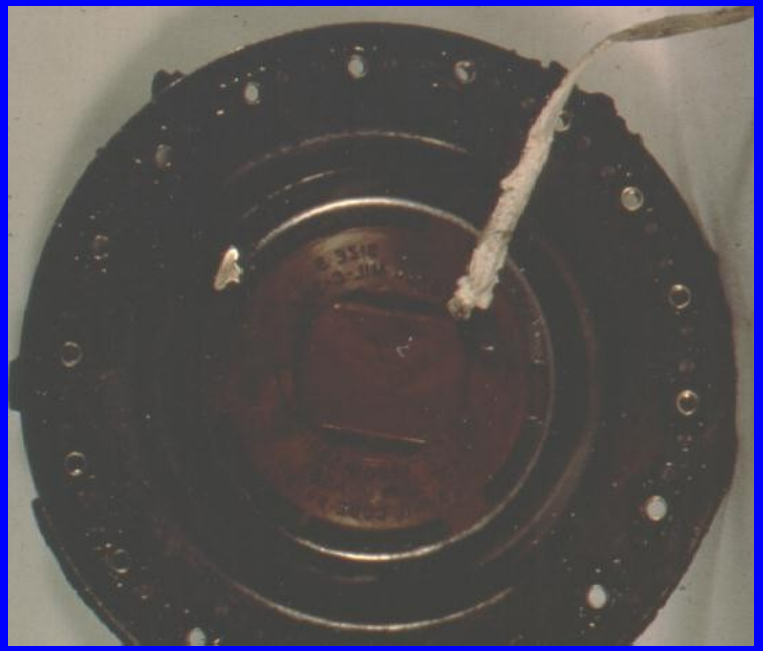

Remove
Tiedowns
Only on
Command

Wind Damage

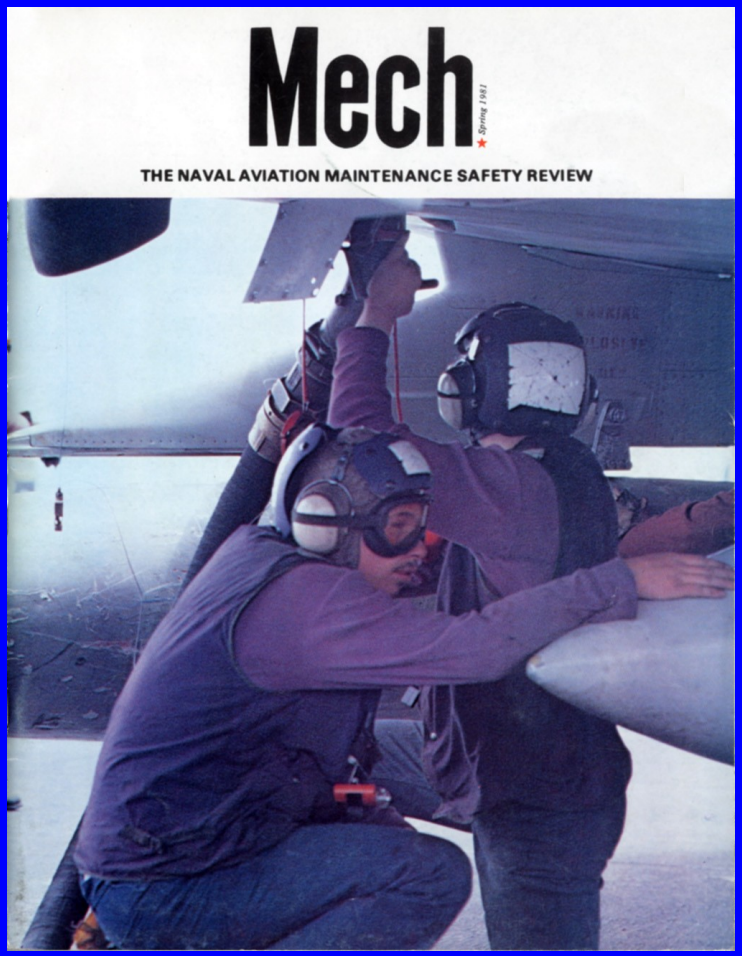


A-4 Fuel Cap

FA-18 Fuel Cap

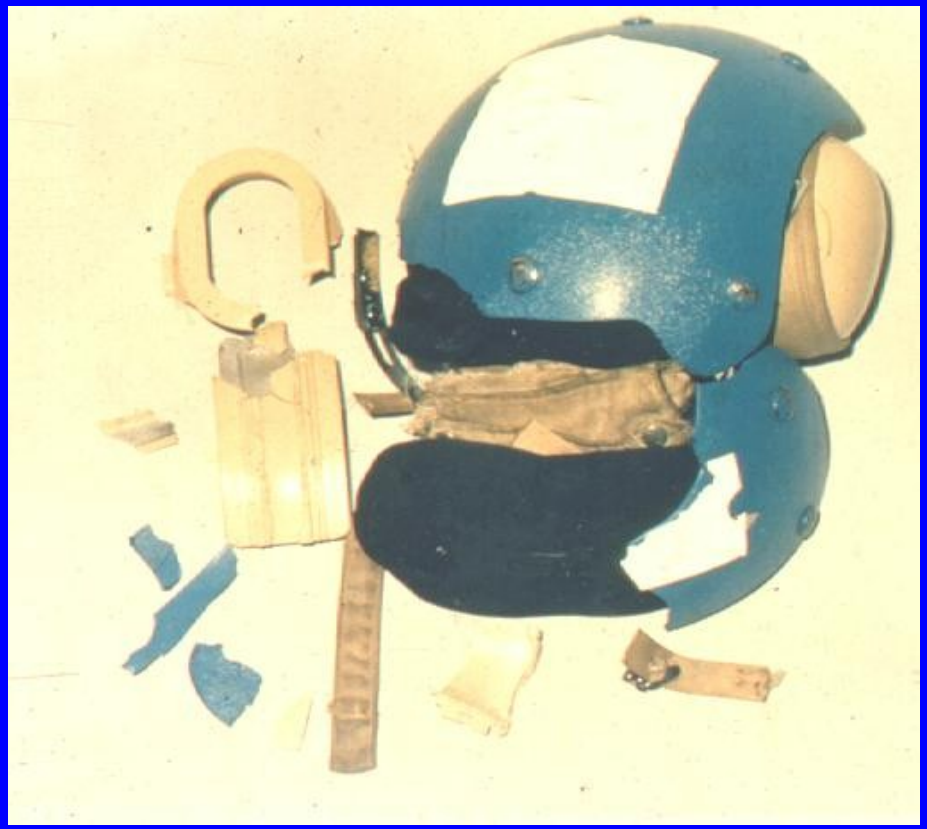


1980s

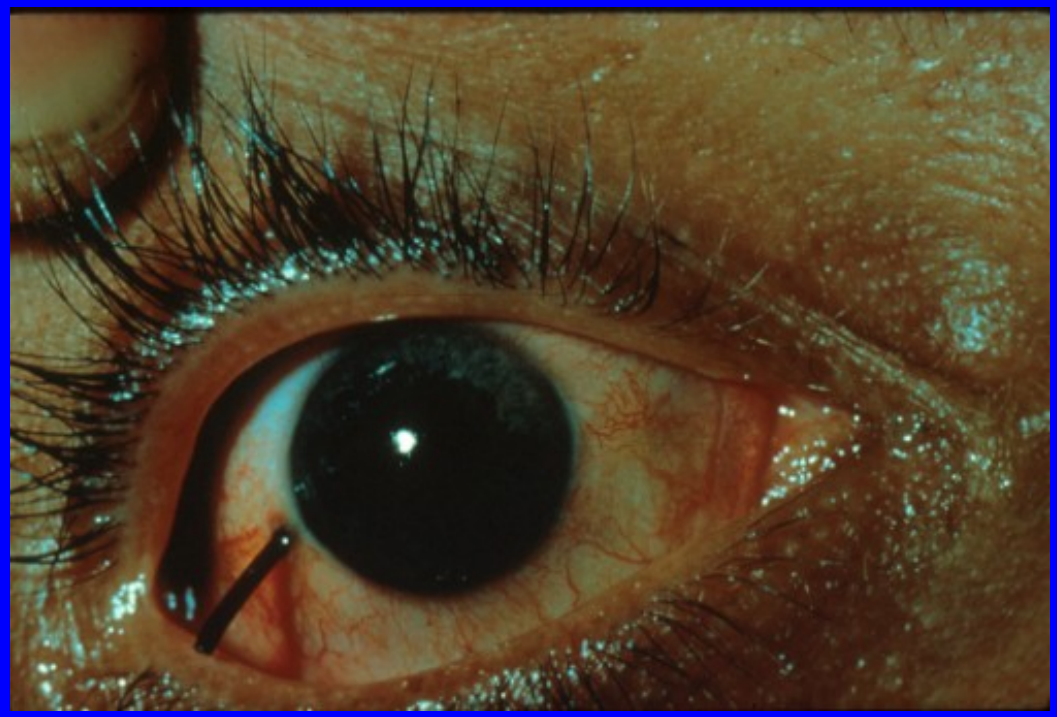

Mech
Spring 1981
THE NAVAL AVIATION MAINTENANCE SAFETY REVIEW


PROPS DO IT, TOO!
Poster idea contributed by VAW-112 Power Plants Division.

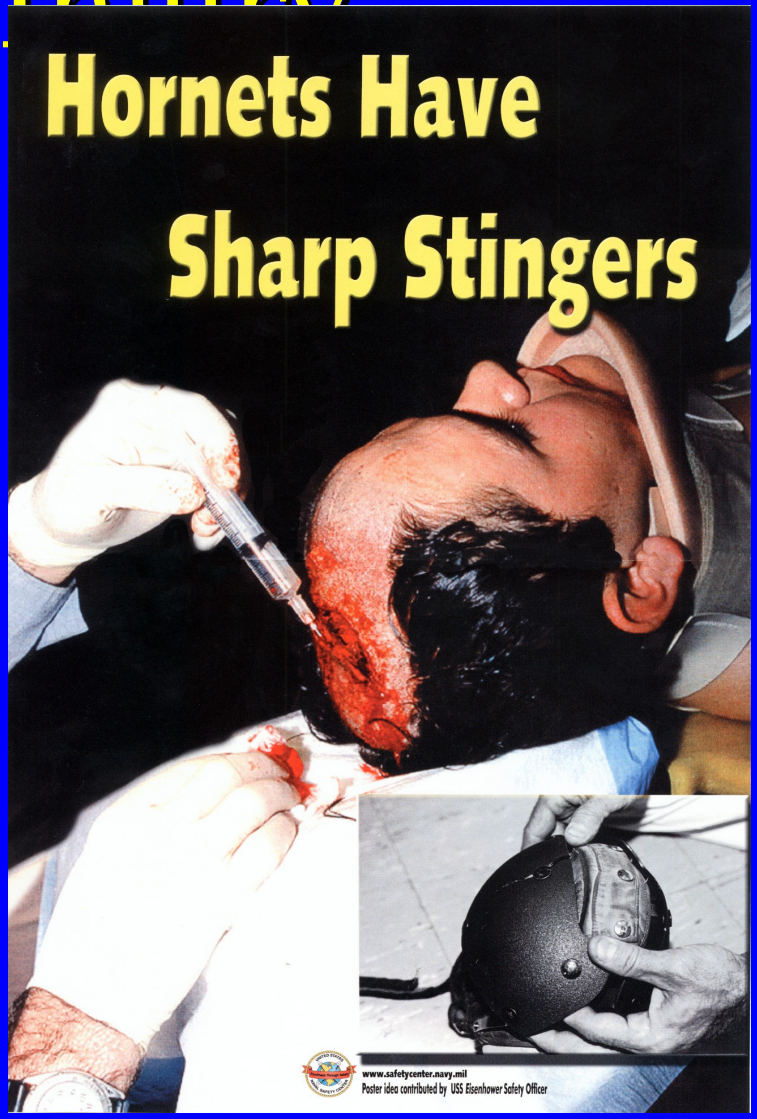
PPE Problems



PPE Problems



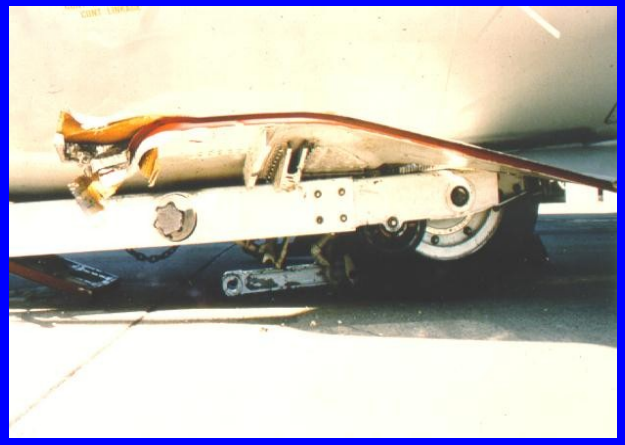
Head Bucket Saves Injury



A-4 NLG Mishap

H-53 NLG Mishap

Repeat Mishaps



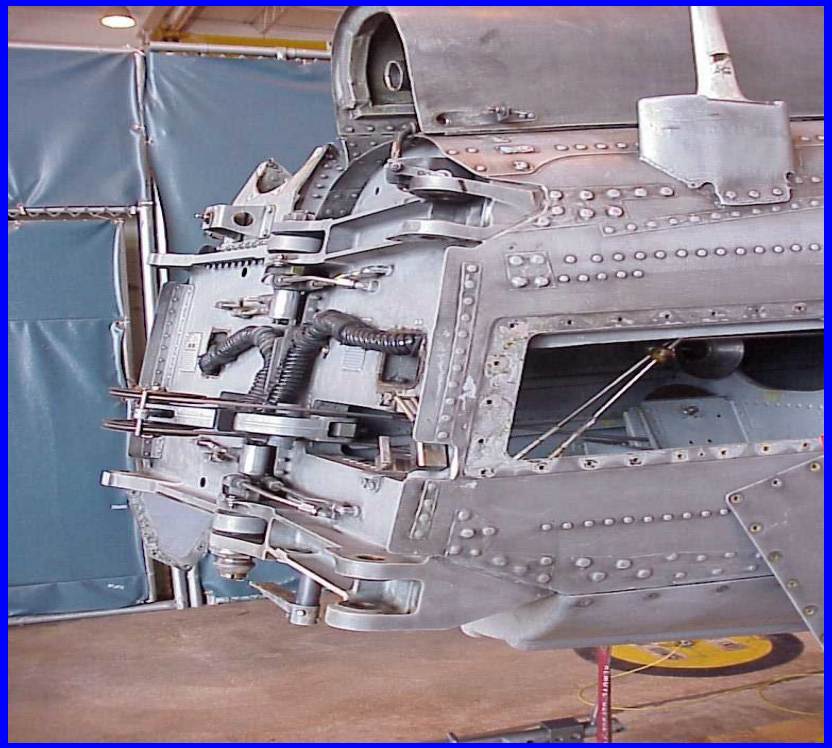
1990s


December 1994 — February 1995
Mech
The Naval Aviation Maintenance Safety Review


And then there were four...
Courtesy of The Royal Navy Flight Safety Magazine

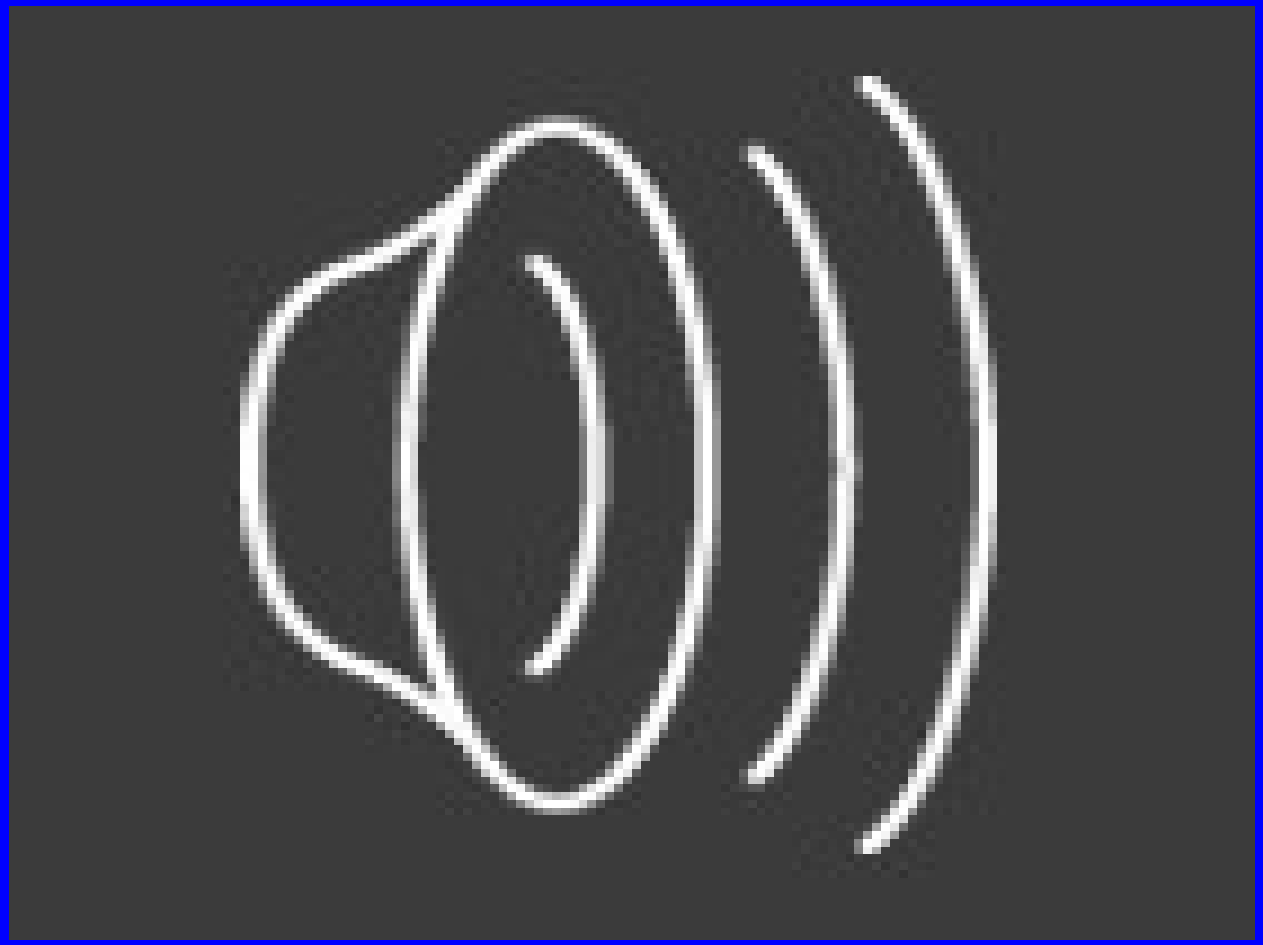
Hand and Finger Injuries

Finger in a Bottle



Aircrew Aren't Exempt

Nan Cart and Wire



2000 to Present

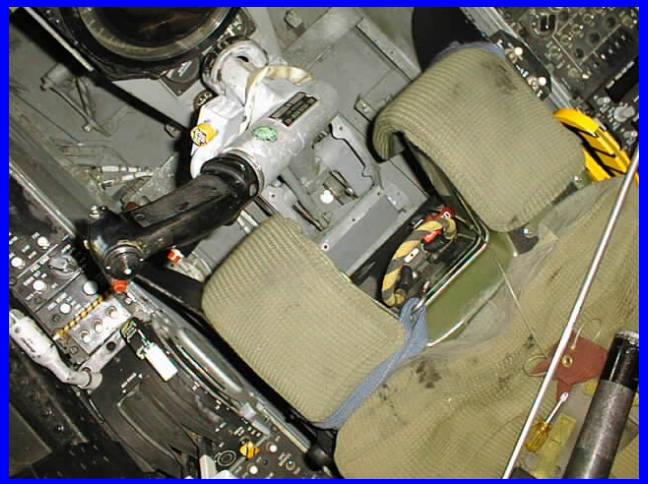
Ordnance Dangers

Hornet Hurts Hoof

Steel Toe, Not Sole

Night Stroll

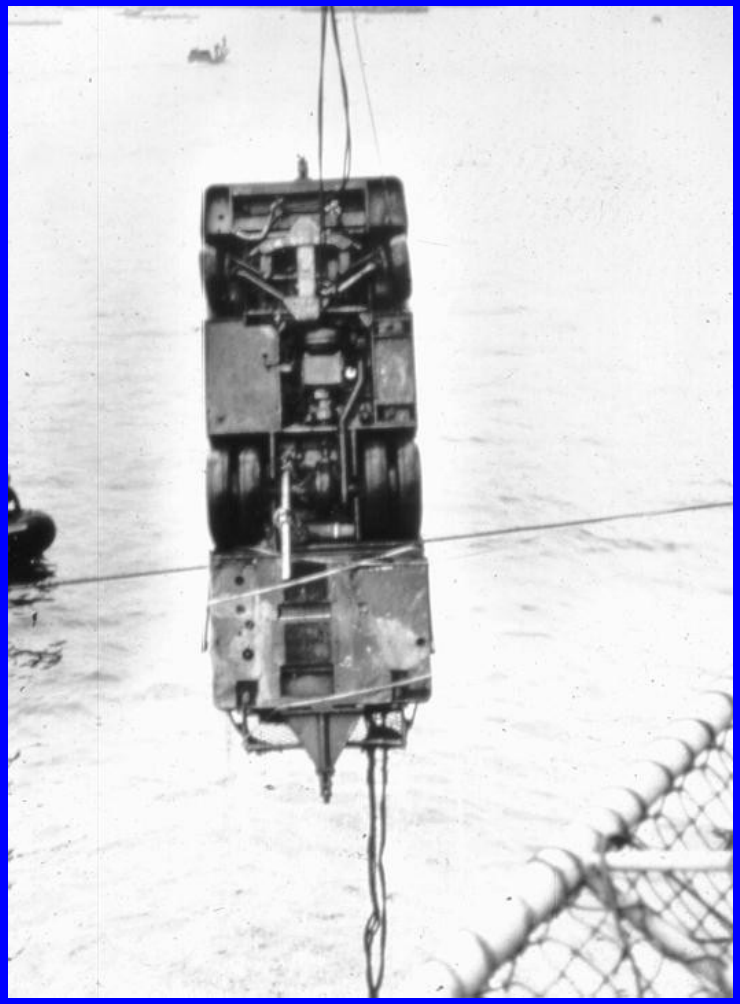
Coins in the Cockpit



OV-10 Smoking Hole

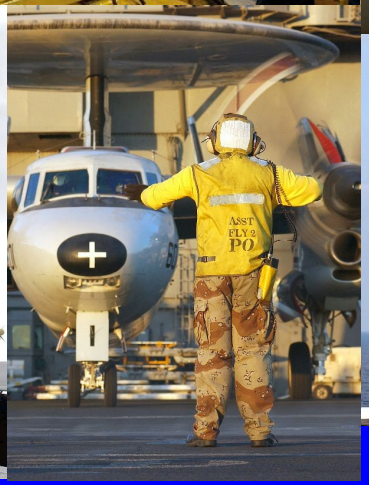
Tow Tractor and A-4

Fishing for SE



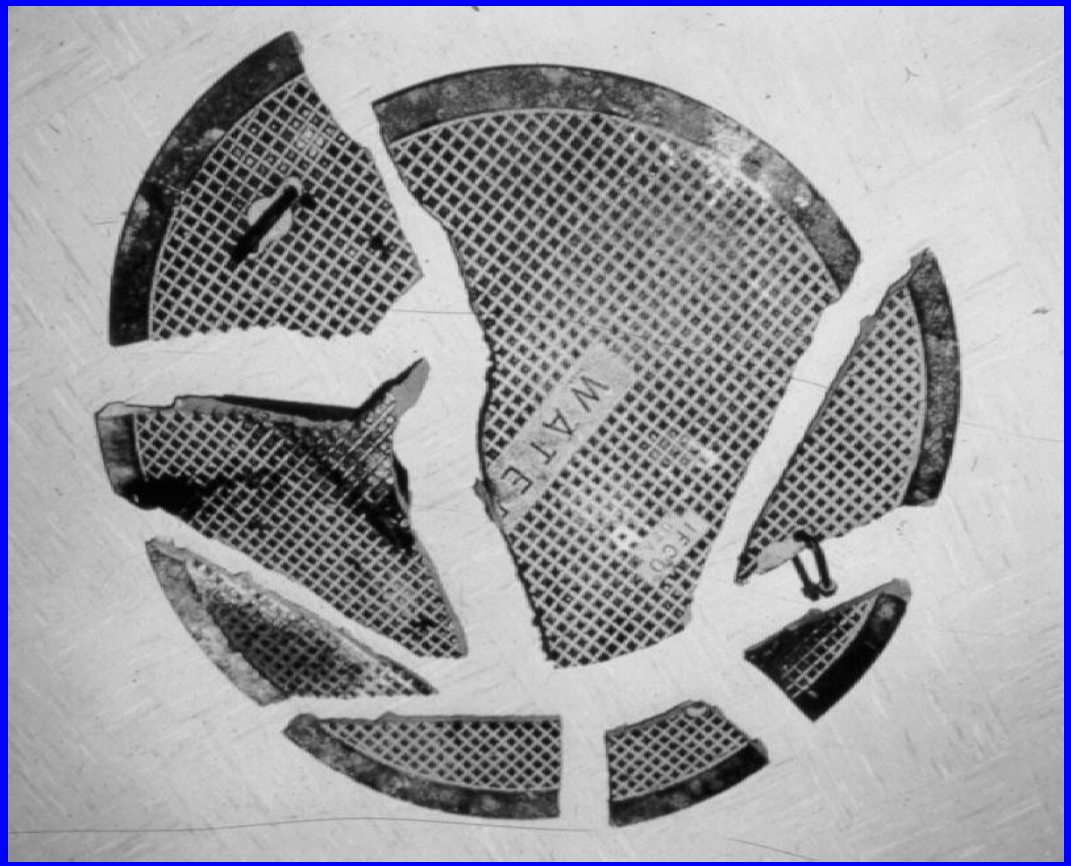
Necessity Is the Mother of Invention. - Plato

Honor, Courage, and Commitment



Character is much easier kept than recovered. - Thomas Paine

Questions



Thank You

Enjoy the Maintenance Safety Conference

Visit us at SP-91
Norfolk, VA